

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board

UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte DAVID A. RUSSO, RYAN R. DIRKX
and GLENN P. FLORCZAK

Appeal 2006-2684
Reissue Application 08/544,212
Patent 5,401,305
Technology Center 1700

Appeal 2006-2747
Reissue Application 09/287,664
Patent 5,401,305
Technology Center 1700

Oral Argument: None¹
Decided: February 8, 2007

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U.S. PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS
AND INTERFERENCES

Before: BRADLEY R. GARRIS, *Administrative Patent Judge*, FRED E. McKELVEY, *Senior Administrative Patent Judge*, and ALLEN R. MacDONALD, *Administrative Patent Judge*.

McKELVEY, Senior Administrative Patent Judge.

DECISION ON APPEALS UNDER 35 U.S.C. § 134

¹ Oral argument was requested in both appeals, but has been waived.

Appeals 2006-2874 and 2006-2747
Applications 08/544,212 and 09/287,664
Patent 5,401,305

1 **A. Statement of the Case**

2 Two appeals are before the Board which we consolidate for the
3 purpose of deciding both appeals with a single opinion.

4

5 Appeal 2006-2684

6 Appeal 2006-2684 is an appeal from a decision of the Examiner
7 rejecting claims in Application 08/544,212, filed 17 October 1995 seeking to
8 reissue U.S. Patent 5,401,305, granted 28 March 1995 based on application
9 08/104,125 filed 13 December 1993.

10 Application 08/104,125 is said to be a continuation-in-part of
11 application 07/814,366, filed 26 December 1991 (now abandoned).

12 Application 08/104,125 is also said to be a continuation-in-part of
13 application 07/814,352, filed 27 December 1991 (now abandoned).

14 The rejection on appeal is of claims 28-29, 31-60 and 65-66 under
15 35 U.S.C. § 251 based on recapture.

16

17 Appeal 2006-2747

18 Appeal 2006-2747 is an appeal from a decision of the Examiner
19 rejecting claims in Application 09/287,664, filed 07 April 1999 seeking
20 to reissue the same patent.

21 Application 09/287,664 is said to be a division on Application
22 08/544,212 involved in Appeal 2006-2684.

23 There are two rejections on appeal.

24 A first rejection is of claims 28-32 under 35 U.S.C. § 251 based on
25 recapture.

1 A second rejection is of claims 28-32 under 35 U.S.C. § 103(a) as
2 being unpatentable over the prior art.

3

4 Real party in interest

5 The real party in interest is Elf Atochem North America, Inc.

6

7 **B. Finding of fact on recapture**

8 The following findings are believed to be supported by a
9 preponderance of the evidence.

10

11

The invention

12 As the specification of the patent sought to be reissued explains,
13 the invention relates to compositions of matter for the chemical-vapor
14 deposition (CVD) of coatings at high rates on glass or glass articles to
15 provide, among other things, (1) controlled refractive index, (2) improved
16 emissivity characteristics, and (3) abrasion resistance. U.S. Patent
17 5,401,305, col. 1, lines 15-20. *See also* col. 4, lines 13-18.

18

Deposition rate is said to be important in the commercial world.

19

According to Appellants, there are many known compositions which
can be used in a deposition process, but all known processes are said to
suffer from one defect or another. Col. 1, line 21 through col. 2, line 64.

22

Further according to Appellants' review of the prior art, we are told
that it cannot be determined what precursor combinations, if any, can be
used for continuous deposition, under conditions and at a rate suitable for
mass production, of mixed metal oxide/silicon oxide films at adequate rates
from readily available and relatively inexpensive reagents. Col. 3, line 65
through col. 4, line 2.

1 Appellants discovered a mixture which they say has made CVD rates
2 possible at rates greater than about 350 Å/sec. Col. 4, lines 18-21.

3 The mixture comprises a precursor for a metal oxide, a precursor for
4 silicon dioxide and one or more additives. Col. 4, lines 21-39.

5 According to the specification, a variety of suitable precursors of
6 metal oxides, including volatile compounds of tin, germanium, titanium,
7 aluminum, zirconium, zinc, indium, cadmium, hafnium, tungsten,
8 vanadium, chromium, molybdenum, iridium, nickel and tantalum.

9 Col. 4, lines 46-53 and col. 5, lines 40-45.

10 Further according to the specification, suitable precursors for silicon
11 oxide include those described by the general formula $R_mO_nSi_p$, where m is
12 from 3 to 8, n is from 1 to 4, p is from 1 to 4 and R is hydrogen or certain
13 organic radicals. Col. 4, line 64 through col. 5, line 2.

14
15 Prosecution history of application leading to the patent

16 The prosecution history of the application leading up to the patent
17 sought to be reissued is relatively straightforward.

18 As filed, Appellants submitted the following original claim 1 (matter
19 in brackets added):

20 A gaseous composition at a temperature
21 below about 200°C at atmospheric pressure,
22 adapted to deposit at least a first layer of tin oxide
23 and silicon oxide onto glass at a rate of deposition
24 greater than about 350 Å/sec. at a temperature
25 below about 200°C, at atmospheric pressure,
26 wherein the composition comprises [1] a precursor
27 of tin oxide, [2] a precursor of silicon oxide, [3] an
28 accelerant selected from the group consisting of

1 organic phosphites, organic borates and water, and
2 mixtures thereof, and [4] a source of oxygen.

3
4 Original specification, page 16.

5 The Examiner entered a rejection of some of the original claims,
6 including original claim 1, as being unpatentable under the enablement
7 provision of the first paragraph of 35 U.S.C. § 112.

8 The Examiner held that the disclosure is enabling only for claims
9 limited to certain compositions, *i.e.*, those wherein the silicon oxide
10 precursor is limited to that recited in original claim 11. Examiner's Action
11 entered 20 September 1994, page 2.

12 Original claim 11 read as follows, bracketed matter added:

13 The composition of claim 1 wherein the
14 precursor of silicon oxide is $R_mO_nSi_p$, where m is
15 from 3 to 8, n is from 1 to 4, p is from 1 to 4 and R
16 is . . . hydrogen or . . . [certain organic radicals].

17
18 In a response received in the Office on 27 October 1994 (Paper 8 of
19 the patent file), Appellants, among other things, (1) cancelled original claim
20 11 and (2) amended original claim 1.

21 Claim 1, as amended, reads as follows, with bracketed matter added,
22 matter in strikeout deleted from original claim 1 and matter in italics added
23 to original claim 1:

24 A gaseous composition at a temperature
25 below about 200°C at atmospheric pressure,
26 adapted to deposit at least a first layer of tin oxide
27 and silicon oxide onto glass at a rate of deposition
28 greater than about 350 Å/sec. ~~at a temperature~~
29 ~~below about 200°C, at atmospheric pressure,~~
30 wherein the composition comprises [1] a precursor
31 of tin oxide, [2] a precursor of silicon oxide *of the*

1 *formula R_mO_nSi_p, where m is from 3 to 8, n is from*
2 *1 to 4, p is from 1 to 4 and R is ... hydrogen or ...*
3 *[certain organic radicals], [3] an accelerant*
4 *selected from the group consisting of organic*
5 *phosphites, organic borates and water, and*
6 *mixtures thereof, and [4] a source of oxygen.*

7

8 What becomes manifest is that apart from cancelling a redundant
9 limitation, Appellants amended original claim 1 to incorporate therein the
10 limitations of original claim 11.

11 Appellants also presented amended claim 4, which reads:

12 The gaseous composition of claim 1 adapted
13 to continuously deposit at least a first layer of tin
14 oxide and silicon oxide onto a continuously
15 moving transparent flat glass substrate.

16

17 All 27 claims of the patent are drawn to gaseous compositions.
18 Col. 9, line 57 through Col. 12, line 41.

19 Presently pending in reissue application 08/544,212 (Appeal
20 2006-2684) are claims 28-29, 31-60 and 65-66.

21 Claims 28-29 and 31-32 are directed to gaseous compositions.

22 Claims 33-38, 50-52, and 56-60 are directed to films.

23 Claims 39-49 and 53-55 are directed to an article comprising a
24 substrate and a film.

25 Claims 65-66 are directed to an oxide composition product.

26 Presently pending in reissue application 09/287,664 (Appeal
27 2006-2747) are claims 28-32, all directed to a process for forming an oxide
28 composition.

1 The reader will appreciate that both applications on appeal contain
2 claims numbered 28, 29, 31 and 32.

Examiner's rejection

5 In both applications, the Examiner rejected all claims as being
6 unpatentable under 35 U.S.C. § 251 based on “improper recapture”
7 [Examiner’s Answer, page 3 (Appeal 2006-2684); Examiner’s Answer,
8 page 5 (Appeal 2006-2747)].

9 We address the claims on an individual basis.

C Analysis of reacquisition issues

Claim 28 (Appeal 2006-2684)

14 Claim 28 (Appeal 2006-2684) reads as follows:

A gaseous composition comprising at least one precursor of a metal oxide, an accelerant selected from the group consisting of organic phosphates, organic borates, and water, and a precursor of silicon oxide having the formula $R_mO_nSi_p$, where m is from 3 to 8, n is from 1 to 4, p is from 1 to 4 and R is independently chosen from hydrogen and . . . [certain organic radicals], wherein said composition is gaseous at a temperature below about 200°C at atmospheric pressure and is adapted to deposit at least a first layer of an oxide and silicon oxide onto a glass at a rate of deposition greater than 350 Å/sec.

For some reason, claim 28 does not track the language of claim 1 of the patent with a mere amendment of tin oxide to metal oxide. Rather, it is re-written with limitations appearing in a different order.

1 As far as we can tell, claim 28 essentially differs from claim 1 of the
2 patent in that it calls for a “metal oxide” whereas claim 1 of the patent calls
3 for “tin oxide.”

4 The Examiner found that claim 28 is (1) broader than rejected
5 application original claim 1 (prior to amendment) because it calls for a metal
6 oxide instead of tin oxide and (2) narrower than rejected application original
7 claim 1 because it limits the silicon compounds to those of application
8 original claim 11.

9 The Examiner also found “[t]he limitation of a tin oxide precursor [in
10 original application claim 1] is germane to the rejection made.” Examiner’s
11 Answer, page 8 (Appeal 2006-2684).

12 Appellants maintained before the Examiner that recapture cannot be
13 based on a lack of enablement rejection, *i.e.*, recapture is limited to
14 rejections based on the prior art.

15 Appellants disagreed with the Examiner that the broadening of tin
16 oxide to metal oxide was germane to the lack of enablement rejection.

17 Citing *In re Wesseler*, 367 F.2d 838, 151 USPQ 339 (CCPA 1966),
18 Appellants maintain that recapture cannot apply apart from a prior art
19 rejection. *Wesseler* involved a rejection under 35 U.S.C. § 112, second
20 paragraph, involving indefiniteness. The CCPA held that an indefiniteness
21 rejection did not provide a basis for a recapture rejection. If a claim is
22 indefinite, it is difficult to see how one can determine what was surrendered.
23 On the other hand, when a rejection is based on lack of enablement
24 commensurate in scope with the breadth of a claim, it is usually apparent
25 what was surrendered.

1 In this case, the Examiner held that subject matter calling for a
2 precursor of silicon oxide beyond that appearing in application original
3 claim 11 would not have been enabled. Appellants amended original
4 application claim 1 to include the silicones of original application claim 11.
5 As in the case of a prior art rejection, it is possible under the facts of this
6 case to see precisely what was surrendered. Accordingly, we see no reason
7 why a recapture rejection cannot be based on a prosecution history where
8 amendments were made to overcome a rejection based on a lack of
9 enablement commensurate in scope with the breadth of a claim. The
10 principles which govern recapture based on amendments made as a result of
11 a prior art rejection apply equally to the rejection made by the Examiner
12 during original prosecution. The notice a member of the public would get
13 from studying the prosecution history of the original application is the same
14 one would normally get from reading a prosecution involving narrowing of
15 claims to avoid a prior art rejection. In this respect, we adopt as our holding
16 what appears to be dicta in *MBO Laboratories, Inc. v. Becton, Dickinson &*
17 *Company*, No. 2006-1062, slip. op. at 12-13 (Fed. Cir. Jan. 24, 2007):

18 The recapture rule is a limitation on the ability of
19 patentees to broaden their patents after issuance.
20 Section 251 is “remedial in nature, based on
21 fundamental principles of equity and fairness, and
22 should be construed liberally.” However, the
23 remedial function of the statute is limited.
24 Material which has been surrendered in order to
25 obtain issuance cannot be reclaimed via Section
26 251: . . . It is critical to avoid allowing surrendered
27 matter to creep back into the issued patent, since
28 competitors and the public are on notice of the
29 surrender and may have come to rely on the
30 consequent limitations on claim scope. . . . The

1 recapture rule thus serves the same policy as does
2 the doctrine of prosecution history estoppel: both
3 operate, albeit in different ways, to prevent a
4 patentee from encroaching back into territory that
5 had previously been committed to the public.
6 (citations omitted.)

7 As a matter of law, we conclude that a recapture rejection may be based on a
8 lack of enablement rejection made during prosecution of the application into
9 the patent sought to be reissued.

10 On the merits of the recapture rejection, it seems manifest that the
11 Examiner's concern in entering the lack of enablement rejection in the
12 original application was the breadth of the silicon compounds. There was no
13 "metal oxide" limitation since the metal was limited to "tin". Accordingly,
14 during the original prosecution no enablement issue arose with respect to
15 "metal" oxide. The error which occurred was Appellants' failure to claim
16 "metal oxide" in place of "tin oxide". We see no reason why Appellants
17 should not be able to do so. We agree with Appellants that the broadening
18 aspect of the claims in the reissue application was not germane to any lack
19 of enablement rejection made by the Examiner during the original
20 prosecution. Moreover, the public reading the prosecution history could not
21 reasonably have believed "metal oxide" had been surrendered because it was
22 never in issue.

23

24 Claims 29 and 31-32 (Appeal 2006-2684)

25 Claim 29 limits the "metal oxide" to a Markush group of metal oxides
26 and is narrower than claim 28. Claim 31 is similar in scope to claim 28.
27 Claim 32 is similar in scope to claim 29, it also limiting the metal oxide to a
28 Markush group of metal oxides.

1 Claims 29 and 31-32 are not subject to recapture essentially for the
2 same reasons that claim 28 is not subject to recapture.

Claim 33 (Appeal 2006-2684)

5 Claim 33 reads as follows:

A film comprising one or more metal oxides and the deposition product of an accelerator wherein said metal oxide is selected from the group consisting of tin oxide, germanium oxide, titanium oxide, aluminum oxide, zirconium oxide, zinc oxide, indium oxide, cadmium oxide, hafnium oxide, tungsten oxide, vanadium oxide, chromium oxide, molybdenum oxide, iridium oxide, nickel oxide, and tantalum oxide and wherein said accelerator is selected from the group consisting of phosphites, borates, alkyl phosphine, arsine and borane derivatives, PH_3 , AsH_3 , B_2H_6 , NF_3 , NO_2 and CO_2 , and water so that when said metal oxide is tin oxide said film contains the deposition product of at least two of said accelerants, with one of said accelerants being water.

23 Notably missing from the film of claim 33 is the presence of any
24 limitation relating to silicon oxide. We note at this point, that while some
25 apparently believe silicon oxide is a metal oxide, the Appellants and the
26 Examiner agree that under the facts of this case silicon oxide is not a metal
27 oxide. In this case, we assume as did Appellants and the Examiner that
28 silicon oxide is not a metal oxide.

29 Claiming a film without silicon oxide would seem to be inconsistent
30 with the overall nature of the invention described in Appellants' patent:
31 "The gaseous composition further includes a precursor for silicon dioxide
32 ..." Col. 4, lines 26-27. Any film deposited on a substrate using the

1 gaseous mixture would also have silicon oxide. Moreover, during the
2 original prosecution, the Examiner determined that precursors of only
3 certain silicon oxide were enabled and Appellants did not argue otherwise in
4 amending original application claim 1 to incorporate the limitations of
5 original application claim 11.

6 Appellants maintain that claim 33 deals with a film which is made
7 from a gaseous composition and that none of the claims in the application
8 which matured into the patent sought to be reissued involved films. While
9 none of the claims in the original application were directed to films *per se*,
10 one cannot overlook claim 4 of the application (which matured into claim 4
11 of the patent) where Appellants claim a gaseous composition adapted to be
12 deposited onto a continuously moving transparent flat glass substrate. What
13 is deposited on the substrate is a film. We would also note that when
14 Appellants received a patent to the gaseous composition of claim 1 of the
15 patent, Appellants and their assignee acquired a right to exclude others from
16 using the gaseous composition of claim 1 of the patent. The principal, if not
17 the only, described use of the gaseous composition is to make films on
18 substrates.

19 We cannot imagine that a member of the public studying the
20 prosecution history of the original application, in the face of the Examiner's
21 lack of enablement rejection, would believe that Appellants could come back
22 to the Office to seek a film claim which does not include the silicon oxide
23 limitation of claim 1 of the patent.²

² At this point, we observe that a lack of enablement rejection of claim 33 is not included in the Examiner's Answer. Perhaps the Examiner felt the recapture rejection was sufficient to dispose of claim 33. In the event of

1 Claims 34-36 and 38 (2006-2684)

2 Claims 34-36 and 38 depend from claim 33 and do not call for the
3 presence of silicon oxide in the film. They stand or fall with claim 33.

4

5 Claim 37 (Appeal 2006-2684)

6 Claim 37 depends from claim 33 and reads:

7 The film of claim 33, further comprising a silicon oxide.

8

9 Claim 37, like application original claim 1, calls for silicon oxide and
10 is not limited to the silicon oxides of application original claim 11.

11 There is absolutely no doubt in our minds that had claim 37 been
12 presented in the application which matured into the patent sought to be
13 reissued that it too would have been rejected based on a lack of enablement.
14 More importantly, a member of the public studying the prosecution history
15 would immediately understand that Appellants are attempting to get back
16 that which was given up. That a film vis-à-vis a gaseous composition is
17 being claimed is of no moment given that the use of the gaseous composition
18 is to make a film. The lack of enablement rejection made during the original
19 prosecution would apply with equal force to a film made from the gaseous
20 composition of original application claim 1.³

further prosecution, we would suggest that claim 33 does not comply with the written description requirement of the first paragraph of 35 U.S.C. § 112. Use of a precursor of silicon oxide would appear to be a material element of Appellants' invention. No film appears to be described which would not include silicon oxide.

³ We note that the Examiner has not rejected claim 35 for lack of enablement. This fact does not undermine the Examiner's recapture

1 Claim 39 (Appeal 2006-2684)

2 Claim 39 is directed to an article and reads:

3 An article comprising a substrate and a film
4 of claim 33 deposited thereon.

5
6 The principal substrate would be glass. See col. 4, line 18.

7 We do not see any material difference between a film claim and an
8 article claim comprising a film and a substrate. The film is useful because it
9 is deposited on a substrate. Accordingly, in our view claim 39 stands or falls
10 with claim 33.

11 Claims 40-42 and 44-47 (Appeal 2006-2684)

12 Claims 40-42 and 44-47 are dependent claims which do not call for
13 the presence of silicon oxide.

14 These stand or fall with claim 33 and 39.

15
16 Claims 43 and 48-49 (Appeal 2006-2684)

17 Claims 43 and 48-49 are dependent claims which further require the
18 presence of “silicon oxide” and are not limited to the silicon oxides of
19 application original claim 11.

20 These claims stand or fall with claim 37.

21
22 Claims 50-52 (Appeal 2006-2684)

23 Claims 50-52 depend from claim 33 and are directed to films.

rejection. The fact is that Appellants are attempting to recapture “silicon oxide” given up during prosecution and that is so whether a lack of enablement rejection is or is not made. Moreover, the Examiner may have felt that a recapture rejection was sufficient to complete examination of the application on appeal without any need to reach other possible rejections.

1 They do not call for the presence of silicon oxide.

2 In our view, these claims stand or fall with claim 33.

3

4 Claims 53-55 (Appeal 2006-2684)

5 Claims 53-55 depend from claim 39 and are directed to an article
6 comprising a film on a substrate.

7 They do not call for the presence of silicon oxide.

8 In our view, these claims stand or fall with claim 39.

9

10 Claims 56-57 (Appeal 2006-2684)

11 Claims 56-57 are directed to films comprising silicon oxide, a metal
12 oxide and an oxide of an accelerator.

13 The silicon oxide is not limited to the silicon oxides of application
14 original claim 11.

15 In our view, claims 56-57 stand or fall with claim 37.

16

17 Claims 58-59 (Appeal 2006-2684)

18 Claim 58 calls for a film and reads as follows:

19 A film comprising the deposition product of
20 monobutyltin trichloride, tetraethyl orthosilicate,
21 and triethyl phosphite.

22

23 Claim 59 calls for a film and reads as follows:

24 A film comprising the deposition product of
25 monobutyltin trichloride, tetraethyl orthosilicate,
26 triethyl phosphite and triethyl borate.

27

28 Claim 58 is a film made from the gaseous composition of claim 27 of
29 the patent, which reads:

A composition according to claim 26 in which the tin oxide precursor comprises monobutyltin trichloride, the silicon oxide precursor comprises tetraethyl orthosilicate and the accelerant comprises triethyl phosphite.

Claim 26 of the patent calls for gaseous composition comprising an accelerant comprising one or both of triethyl phosphite and triethyl borate. Col. 12, lines 36-37.

Claims 58-59 call for films made from gaseous compositions which are included within the scope of the patent claims. The claims are narrower than the claims of the patent. We perceive of no reason why these film claims cannot be the subject of a reissue patent and we further perceive no reason why Appellants are recapturing any subject matter surrendered in taking out the original patent.

Claim 60 (Appeal 2006-2684)

Claim 60 relates to a film and reads:

A film comprising the oxides of tin, silicon and phosphorus.

What is immediately apparent is that the “oxides of . . . silicon” are not limited to the silicon oxides of claim 11 of the patent.

In our view, claim 60 stands or falls with claim 33.

Claims 65-66 (Appeal 2006-2684)

Claim 65 reads:

1 A product which is an oxide composition
2 produced by the process of oxidizing the
3 composition comprising the oxide precursor and
4 accelerant of any one of claims 1-29 and 31-32.
5

6 Claim 66 reads:

7 A product produced by the process of claim
8 65, wherein said oxidizing is effected in a
9 chemical vapor deposition process.

10 These claims depend from claims which are not subject to recapture.

11 Claims 1-27 are original patent claims. We have determined that
12 claims 28-29 and 31-32 are not subject to recapture. Accordingly, it
13 follows that claims 65-66 stand or fall with claims 28-29 and 31-32 and are
14 not subject to recapture.
15

16

17 Claims 28-29 and 31-32 (Appeal 2006-2474)

18 Claim 28 calls for a process for forming an oxide composition and
19 reads as follows:

20 A process for forming an oxide composition
21 comprising oxidizing a gaseous composition
22 comprising at least one precursor of a metal oxide
23 and an accelerator selected from the group
24 consisting of organic phosphites, organic borates,
25 and water so that when said precursor of a metal
26 oxide is a tin oxide precursor, and said accelerator
27 includes water, said composition also contains at
28 least one of said organic phosphites or organic
29 borates.

30

31 Claim 29 further limits the metal oxide to a Markush group of metal
32 oxides, including tin oxide.

33 Claim 31 is similar to claim 28.

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Patent 5,401,305

1 Claim 32 is similar to claim 29

2 None of claims 28-29 and 31-32 call for a silicon oxide to be used in
3 the process.

4 In essence, the claims are directed to a method of using the gaseous
5 composition of claim 1 of the patents sans any silicon oxide and can be used
6 to make some of the films of claim 33 (Appeal 2006-2684).

7 In our view, these claims stand or fall with claim 33 (Appeal
8 2006-2684).

9

10 Claim 30 (Appeal 2006-2747)

11 Claim 30 reads as follows:

12 The process of claim 28 [Appeal 2006-2747]
13 further comprising a precursor for a silicon oxide.

14

15 Immediately apparent is the fact that the “a silicon oxide” is not
16 limited to the silicon oxide mentioned in application original claim 11.
17 In our view, claim 30 stands or falls with claim 37 (Appeal 2006-2684).

18

19 Summary of resolution of recapture rejections

20 The Examiner’s recapture rejection of claims 28-29, 31-32, 58-59, and
21 65-66 (Appeal 2006-2684) is reversed.

22 The Examiner’s recapture rejection of claims 33-57 and 60 (Appeal
23 2006-2684) is affirmed.

24 The Examiner’s recapture rejection of claims 28-32 (Appeal
25 2006-2747) is affirmed.

1 **D. Findings of fact on obviousness**

2 The following findings are believed to be supported by a
3 preponderance of the evidence.

4

5 Examiner's obviousness rejection

6 In Appeal 2006-2747, the Examiner also rejected claims 28-32 as
7 being unpatentable under 35 U.S.C. § 103(a) over the prior art.

8 In particular, the Examiner rejected claims 28-32 as being
9 unpatentable over (1) Lagendijk (U.S. Patent 5,028,566) in view of
10 (2) Gordon (U.S. Patent 4,308,316).

11 Gordon is prior art under 35 U.S.C. § 102(b), having issued more than
12 one year prior to the filing date of the application which matured into the
13 patent sought to be reissued.

14 Lagendijk is prior art under 35 U.S.C. § 102(b) vis-à-vis the filing
15 date of the application which matured into the patent sought to be reissued.

16 Appellants also claim benefit under 35 U.S.C. § 120 of two earlier
17 applications, the earliest of which was filed on 27 December 1991.

18 Assuming without deciding that Appellants are entitled to an effective filing
19 date of 27 December 1991, Lagendijk is nevertheless prior art under
20 35 U.S.C. §102(e). The filing date of the application which matured into the
21 Lagendijk patent was filed on 27 July 1990. Appellants have made no
22 attempt to antedate Lagendijk. Accordingly, for the purpose of deciding this
23 appeal, Lagendijk is prior art.

24 The Examiner also observed—correctly—that the prior art relied upon
25 is "representative of a large body of art disclosing CVD [chemical vapor

1 deposition] source solutions comprising metal oxide precursors and
2 accelerants." Examiner's Answer, page 3 (Appeal 2006-2747).

3 To confirm the correctness of the Examiner's observation, one need go
4 no further than the specification of the patent sought to be reissued where
5 one can find a discussion of the prior art.

6 Two prior art references discussed Appellants' specification are
7 (1) Gordon (U.S. Patent 4,206,252) and (2) Hochberg, *J. Electrochem. Soc.*
8 136(6) 1843 (1989). Gordon is mentioned at col. 2, lines 15-27 and
9 Hochberg is mentioned at col. 3, lines 55-64. Both are prior art vis-à-vis
10 Appellants under 35 U.S.C. § 102(b).

11
12 Examiner's rationale

13 The Examiner found, and Appellants do not seem to disagree, that the
14 subject matter described in Example 4 of Lagendijk differs from the claimed
15 subject matter in that it does not include a metal oxide. Examiner's Answer,
16 page 3 (Appeal 2006-2747).

17 The Examiner also found that Examples 4-14⁴ of Gordon '316
18 describe the use of a combination of a silicon oxide and a metal oxide,
19 including oxides of indium, aluminum and zinc to obtain certain properties
20 in films. Examiner's Answer, page 4.

21 The Examiner reasoned that it would have been obvious, in view of
22 Gordon '316 to use a metal oxide in combination with the silicon oxide in
23 the process of Lagendijk in order to obtain those same properties.
24

⁴ The Examiner's Answer refers to "claims 4-14." In context, it is clear that the Examiner meant to refer to Examples 4-14.

Appellants' position

2 Appellants maintain that there is no "motivation" to use a metal oxide
3 in combination with the silicon oxide of Lagendijk. Appeal Brief, page 6
4 (Appeal 2006-2747).

5 Appellants further maintain that Gordon '316 "teaches the
6 undesirability of water, cautioning against it in example 2, which ... [is said
7 to show that] water causes an undesirable reaction with an organoaluminum
8 compound, e.g., (aluminum-2,4-pentanedionate)." *Id.*

9 Appellants still further maintain that “[t]he adverse results with water
10 would suggest to a skilled artisan that disclosure of ancillary compounds in
11 CVD coating processes in this art would not carry the implication that they
12 would benefit any coating process, but rather, each candidate for evaluation
13 as an adjuvant would require separate testing before they [sic—one having
14 ordinary skill in the art] could draw any conclusion about its [i.e., the
15 candidate's] suitability in the process.” *Id.* at pages 6-7. Arguably
16 consistent with Appellants' position is the following statement in the patent
17 (col. 3, line 65 through col. 4, line 2):

18 From a review of the prior art, it cannot be
19 determined what precursor combinations, if any,
20 can be used for continuous deposition, under
21 conditions and at a rate suitable for mass
22 production, of mixed metal oxides/silicon oxide
23 films at adequate rates from readily available and
24 relatively inexpensive reagents.

26 Appellants lastly maintain that they are using unobvious starting
27 materials in their claimed process and therefore the obviousness issue is

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1 controlled by *In re Ochiai*, 71 F.3d 1565, 37 USPQ2d 1127 (Fed. Cir. 1995).

2 *Id.* at 7.

3

4 Examiner's observation on candidate testing

5 The Examiner had the following observation on Appellants'
6 "every candidate needs a test" argument [Examiner's Answer, page 5
7 (Appeal 2006-2747)]:

8 Applicants' argument that every candidate for
9 evaluation in the art would require separate testing
10 before drawing any conclusions is rebutted by the
11 broad scope of materials disclosed and claimed in
12 each of the prior art references of record. Further,
13 the argument suggests that the instant
14 specification, which does not include testing and
15 evaluation of each species implicitly or explicitly
16 claimed, is insufficient [under the enablement
17 requirement of first paragraph of 35 U.S.C. § 112]
18 to support claims having the breadth of scope of
19 instant claims 28-32.

20
21 We understand the Examiner to say that if the Examiner erred in
22 making a § 103 rejection, then the claims are not patentable under the
23 enablement requirement of the first paragraph of 35 U.S.C. § 112. In other
24 words, Appellants cannot have it both ways by presenting broad claims
25 while at the same time maintaining that one skilled in the art would not
26 expect, absent tests, the prior art to be effective.

27
28 Gordon '252

29 Gordon '252 is a patent cited in Appellants' specification and
30 manifestly is part of "the prior art . . . of record" mentioned by the Examiner.
31 Col. 2, lines 15-27.

1 Here is what Appellants say about Gordon '252:

In U.S. Pat. No. 4,206,252, Gordon describes a process for depositing mixed oxide and nitride coating layers of continuously varying refractive index between a glass substrate and an infra-red-reflecting coating, whereby the film iridescence is eliminated. When silicon dioxide is part of the mixed oxide film, the patent teaches that volatile silicon compounds with Si—Si and Si—H bonds are suitable precursors. Compounds such as 1,1,2,2-tetramethyldisilane, 1,1,2-trimethyldisilane, and 1,2-dimethyldisilane are disclosed. All of the compounds containing Si—Si and Si—H bonds to which reference is made are expensive, and none are commercially available.

Reference to Gordon '252 confirms that Appellants are correct, at least in part.

Plainly described in Gordon '252 is the use of a mixture of silicon and tin precursors to make the film. See, e.g., Col. 6, line 64 through col. 7, line 5.

While it is true that Gordon '252 describes the use of a mixture of a mixed silicon oxide and silicon nitride (col. 6, line 12), Gordon '252 also describes the use of other silicon and metal combinations, including (1) silicon and tin (col. 6, line 11), (2) silicon and titanium (col. 6, line 13), and (3) silicon and indium (col. 6, line 14).

Hochberg

Hochberg is a prior art document cited in Appellants' specification (col. 3, lines 55-64).

31 Appellants say the following about Hochberg:

1 A. K. Hochberg and D. L. O'Meara in *J.*
2 *Electrochem Soc.* 136(6) 1843 (1989) reported
3 enhanced deposition of silicon oxide films at
4 570°C. by CVD [chemical vapor deposition] at
5 low pressure when trimethylphosphite was added
6 to TEOS [tetraethyl orthosilicate—col. 2, line 40].
7 As with plasma-enhanced CVD, however, low-
8 pressure CVD is not readily utilized for the
9 continuous commercial application of silicon-
10 oxide films on a moving glass sheet to produce a
11 coated-glass article due at least in part to the cost
12 and complexity of the device used for deposition at
13 low pressure.
14

15 What one skilled in the art learns from Appellants' discussion of
16 Hochberg is that enhanced deposition of silicon oxide films at 570°C can be
17 achieved if trimethylphosphite is added to TEOS.

18 **E. Analysis of obviousness**

19
20 Claim interpretation

21 The language of claim 28 (Appeal 2006-2747) is somewhat unusual,
22 particularly the limitation "so that when said precursor of a metal oxide is a
23 tin oxide precursor, and said accelerant includes water, said composition
24 also contains at least one of said organic phosphites or organic borates."

25 It is not entirely clear to us where the quoted limitation finds support
26 in the specification.

27 From the specification, we learn that Appellants believe that borate
28 and phosphite esters, alkyltin halides, and water are accelerants. Col. 9,
29 lines 31-34. We also find data reported from experimental work involving
30 (1) water—Table I and (2) trimethylphosphite—Table II. We also find
31 examples describing the use of (1) a tin oxide precursor (MBTC, which is

1 monobutyltin trichloride; col. 6, line 20), (2) TEOS, and (3) TEP, (which is
2 triethyl phosphite; col. 6, line 21). *See Examples 1 and 2.* Also described is
3 the use of (1) MBTC, (2) TEOS, and (3) water. *See Example 3.*

4 Based on our reading of the underlying specification and giving the
5 claim its broadest reasonable interpretation consistent with the specification,
6 it is our view that the limitation in question is a "proviso" limitation
7 restricting the process only when (1) the precursor is a tin oxide precursor
8 and (2) the accelerant includes water.

9 Claim 28 does not require the presence of water when the precursor is
10 a tin oxide precursor. The proviso comes into play only when water is used
11 in combination with a precursor of tin oxide. A similar analysis applies with
12 equal force with respect to claim 31.

13 Only claim 30 requires the presence of a silicon oxide. If claim 30 is
14 unpatentable on the merits, then so are claims 28-29 and 30-31.

15
16 Unpatentability of claims 28-32 (Appeal 2006-2747) on the merits
17

18 In our opinion, claims 28-32 are unpatentable on the merits.
19

Scope and content of the prior art

20 Appellants cannot deny that the prior art describes compositions
21 which can be made using a precursor of silicon oxide. See (1) Lagendijk
22 and (2) Gordon '316 (Table D, compounds 1-3).

23 Appellants cannot deny that the prior art describes compositions
24 which can be made using a precursor of tin oxide. See Gordon '316 [Table
25 D, compound 13 (tetramethyl tin)].

1 Based on a review of Gordon '252 cited in Appellants' specification,
2 Appellants cannot deny that the prior art also describes compositions which
3 can be made using a mixture of (1) a precursor of silicon oxide and (2) a
4 precursor of a metal oxide, including tin oxide, titanium oxide and indium
5 oxide (Table A, col. 6, lines 8-15).

6 Lastly, based on their description of Hochberg in their specification,
7 Appellants cannot deny that trimethyl phosphite (TMP) is known in the art
8 for enhanced deposition of silicon oxide films.

Differences

11 The difference between Gordon '252 and the subject matter of claim
12 30 is that Gordon '252 does not describe the use of trimethyl phosphite as an
13 enhancer to the deposition of a mixture of both a silicon oxide and a tin
14 oxide precursor.

15 The difference between Hochberg and the subject matter of claim 30
16 is that Hochberg does not describe the use of a tin oxide precursor along
17 with a precursor of silicon oxide.

Level of skill in the art

20 In this case, the prior art provides the evidence of the level of skill in
21 the art in this particular case.

22 Those skilled in the art use known techniques to accomplish known
23 objectives. What we learn from Hochberg is that a person having ordinary
24 skill in the art would understand that TEP can be used to enhance deposition
25 rates of films made from silicon oxide. Accordingly, the level of skill is

1 such that if enhanced deposition rates for making silicon oxide films is the
2 objective, then one skilled in the art would use TEP.

3

4

Discussion

5 The obviousness analysis turns on whether one having ordinary skill
6 in the art would use TEP in a process for making a composition for the CVD
7 of a mixed tin oxide/silicon oxide film. We think one skilled in the art
8 would have done so.

9 When making a composition for use in the CVD process which
10 contains precursor of silicon oxide, one is explicitly taught by the prior art of
11 the advantage of also using TEP. One skilled in the art is also taught to use
12 a mixture of precursors of tin oxide and silicon oxide. On this record, we do
13 not see why one skilled in the art would not also use TEP when attempting
14 to make a composition with a mixture of a tin oxide precursor and a silicon
15 oxide precursor. There is no credible reason not to expect that the
16 advantages of enhanced deposition to be obtained by using TEP in a silicon
17 oxide precursor composition would not apply to using TEP in a mixed tin
18 oxide/silicon oxide precursor mixture if for no other reason than the mixture
19 also has a silicon oxide precursor.

20 Appellants' "no motivation" argument misses the mark. *First*, we
21 will note that the word "motivation" does not appear in 35 U.S.C. § 103.
22 *Second*, to the extent that by "motivation" Appellants would require the
23 Examiner to come up with an explicit teaching in the prior art of motivation,
24 that requirement is foreclosed by binding precedent of our appellate
25 reviewing court. *See, e.g., In re Rosselet*, 347 F.2d 847, 851, 146 USPQ
26 183, 186 (CCPA 1965); for more recent discussion *see also, e.g., Alza Corp.*

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1 *v. Mylan Laboratories, Inc.*, 464 F.3d 1286, 80 USPQ2d 1001 (Fed. Cir.
2 2006); *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick*
3 *Co.*, 464 F.3d 1356, 1360-61, 80 USPQ2d 1641, 1645 (Fed. Cir. 2006).

4 What seems apparent on this record is that if one skilled in the art
5 knows that TEP can be used to make compositions containing silicon, then
6 one skilled in the art would have a reasonable expectation that TEP could be
7 used in similar compositions containing both silicon and tin. A reasonable
8 expectation of success is all that is required. *In re O'Farrell*, 853 F.2d 894,
9 904, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988); *In re Longi*, 759 F.2d 887, 897,
10 225 USPQ 645, 651-52 (Fed. Cir. 1985).

11 Appellants' "no motivation" argument is seemingly bottomed on a
12 reasonable expectation that the combination would not be successful. Apart
13 from attorney argument, which of course is not evidence, the only
14 "evidence" in this record to support the attorney argument is Appellants'
15 admission at col. 3, line 65 through col. 4, line 2 of Appellants' patent.
16 However, that admission on its face is narrowly drawn to rates suitable for
17 "mass production" from "readily available and relatively inexpensive
18 reagents." The claims before us are not limited to any particular use (rates
19 suitable for mass production) or to particular reagents (inexpensive
20 reagents). Moreover, we are not aware of any requirement of law that
21 obviousness be evaluated on the sole basis of whether an invention can be
22 used in commercial practice. The useful arts can be promoted by inventions
23 which never become commercial.

24 Appellants also claim there is a lack of "motivation" because Gordon
25 '316 says in Example 2 that water is to be avoided, at least when aluminum-
26 2,4,-pentanedionate is used as a metal oxide precursor. The obviousness

1 analysis which we find sufficient involves precursors of silicon and tin oxide
2 and TEP. It is on the basis of the obviousness of the use of this particular
3 mixture that the Examiner is believed to have bottomed the rejection. Since
4 Appellants' claims include a method for making a composition from a
5 silicon oxide precursor, a tin oxide precursor and TEP (without the use of
6 water), the claims are broad enough to read on subject matter which is
7 obvious and therefore are not patentable. *In re Muchmore*, 433 F.2d 824,
8 167 USPQ 681 (CCPA 1970).

9 Appellants also argue that they are using "unobvious" starting
10 materials and therefore the *Ochiai* rationale applies. We are at a loss to
11 understand Appellants' argument because all the ingredients used in
12 Appellants' process were known in the art long before Appellants made their
13 invention.

14 To complete our analysis, it seems to us that the Examiner has a point
15 when responding to Appellants' lack of predictability argument. If, as
16 Appellants seem to argue, there is no reasonable expectation of success,
17 where is the disclosure in Applicants' specification to support the breadth of
18 the claims before us? *First*, apart from claim 30, the claims do not require
19 the presence of a precursor of silicon oxide. The entire tenor of the
20 specification would seem to require the presence of a precursor. *Second*, if
21 the invention involves unpredictable subject matter, then how is the enabling
22 disclosure in the specification commensurate in scope with the breath of the
23 unpredictable subject matter being claimed? Appellants did not respond in
24 their reply to the Examiner's point and have not reconciled how the prior art

1 is not enabling while at the same time their specification is enabling.⁵ It
2 follows that if a rejection under § 103(a) is not viable, the claims are
3 unpatentable under the enablement requirement of the first paragraph of
4 § 112.

5

6 **F. Other issues**

7 Appellants request that the rejections be reversed and that the reissue
8 application be remanded to the Examiner "for issuance of a Notice of
9 Allowance." Our function as a Board is to review rejections. In those cases
10 where we reverse a rejection, the application is necessarily remanded to the
11 Examiner for action consistent with our reversal. 37 C.F.R. § 41.54 (2006).
12 Cf. *In re Fisher*, 448 F.2d 1406, 171 USPQ 292 (CCPA 1971) (every
13 reversal is a patent case is in effect a remand). We do not order the
14 Examiner to issue notices of allowance.

15 Appellants also request, in the event of an affirmance, that they be
16 allowed to dedicate the invention to the public on two conditions: (1) an
17 interference be declared between Appellants and three patents owned by
18 another entity and (2) Appellants prevail in the interference(s). As an *ex*
19 *parte* appeals panel we have no occasion to address Appellants' request as it
20 is not relevant to the appeal under § 134. Whether there is interfering
21 subject matter is a matter the Examiner can consider when *ex parte*

⁵ In the event of further prosecution, we would suggest that claims 28-29 and 31-32 do not comply with the written description requirement of the first paragraph of 35 U.S.C. § 112. Use of a precursor of silicon oxide would appear to be a material element of Appellants' invention. No composition for making a film appears to be described which would not include silicon oxide.

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1 prosecution is resumed following this appeal. If the Examiner is of the
2 opinion that there is interfering subject matter, the Examiner is free to
3 recommend to the Trial Division that an interference be declared.

4 We also note that Appellants have filed a response to the Interlocutory
5 Order entered 14 December 2006. In that response, Appellants request that
6 certain claims be cancelled and that amendments be entered. The response
7 did not squarely answer the information sought by the Interlocutory Order.
8 We express no views on the appropriateness of any amendment. Whether an
9 amendment can be made at this stage of prosecution in the two reissue
10 applications, and, if so, whether these particular amendments should be
11 entered, is a matter we leave to the sole discretion of the Examiner in the
12 first instance.

13

14 **G. Judgment**

15 **Appeal 2006-2684**

16 The Examiner's rejection of claims 28-29, 31-32, 58-59, and 65-66
17 based on recapture is reversed.

18 The Examiner's rejection of claims 33-57 and 60 based on recapture
19 is affirmed.

20 **Affirmed-in-Part and Reversed-in-Part**

21

22 **Appeal 2006-2747**

23 The Examiner's rejection of claims 28-32 based on recapture is
24 affirmed.

25 The Examiner's rejection of claims 28-32 based on unpatentability
26 under 35 U.S.C. § 103(a) is affirmed.

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Affirmed

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